

Chemical dependency treatment and employment outcomes: results from the 'ADATSA' program in Washington State

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Abstract

The *Alcohol and Drug Addiction Treatment and Support Act* (ADATSA) created a treatment program for indigent clients in Washington State. This research assesses the relationship between the level of treatment services received and subsequent employment outcomes. Clients who completed their plan of treatment earned more than those who did not, controlling for other factors. Those clients who received vocational services, in addition to completing treatment, earned more than those who completed treatment only. While on average wages were low, this study does show that clients once deemed 'unemployable' can become productive. © 2000 Elsevier Science Ireland Ltd. All rights reserved.

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1. Introduction

Chemical dependency treatment programs have been evaluated on a number of outcomes, such as subsequent substance use, medical costs, and criminal justice involvement. For the most part, studies have shown beneficial effects associated with treatment (Saxe, 1983; Holder et al., 1992). Despite an increasing interest in evaluating publicly-funded programs, few studies have examined the relationship between treatment and subsequent earnings. That is the purpose of this study.

In 1987, the Washington State legislature passed the *Alcohol and Drug Abuse Treatment and Support Act* (ADATSA), creating a program for indigent adults deemed unemployable and incapacitated as a result of their addiction. Prior to passage of this legislation, such clients were able to receive public assistance in the form of cash grants, but did not necessarily receive treatment for their addiction. This legislation was designed to remedy that situation. The program is administered by

the Division of Alcohol and Substance Abuse (DASA), which is housed within Washington State's Department of Social and Health Services. It provides for 6 months of chemical dependency treatment in any 2-year period, as well as financial support during treatment.

The primary emphasis of treatment is abstinence. However, employment remains an important outcome, for it represents a behavior that integrates clients with the larger society, and allows for economic self-sufficiency. Thus, employment functions as an indicator of social rehabilitation (Metzger and Platt, 1990). Indeed, Catalano et al. (1988) argue that employment is important because, among other reasons, it can act to protect against relapse. Numerous studies support this hypothesis (Westermeyer, 1989). In addition, employment after treatment is associated with a wide variety of positive mental and physical outcomes, such as reduced levels of anxiety, depression and fatigue (Braunstein et al., 1983).

In spite of its importance, the amount of research devoted to assessing the relationship between chemical dependency treatment and employment is small, and equivocal. For example, several studies used data from

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the treatment outcome prospective study (TOPS), a longitudinal study of drug treatment (Hubbard et al., 1984). Research from that study found that the association between treatment and earnings depended on the modality of treatment. A positive relationship was found between outpatient treatment and subsequent earnings, but the size of the effect was small. However, there was a weak and statistically insignificant relationship between other treatment modalities, residential treatment and methadone therapy, and earnings (French and Zarkin, 1992). In contrast, a study using data from Oregon found that clients completing treatment earned 65% more than clients who did not complete treatment, over a 3-year follow-up period (Finigan, 1996). However, that study did not control for an important covariate, earnings prior to treatment.

This study examined employment outcomes of a group who, until this point, has received little attention: chemically addicted clients who, in addition to being addicted, were also indigent. These clients present a complex challenge for policy, which must be devised to deal with both addiction and the need to become economically self-sufficient. This study addressed three questions: (1) did those who completed treatment earn more than those who did not? (2) did those who received vocational services in addition to drug and alcohol treatment earn more than other clients? and (3) if group differences existed, were they consistent across time?

2. Methods

2.1. The process of getting treatment under ADATSA

Table 1 gives details of the process required to enter treatment under the ADATSA program. All potential clients began with a visit to a community service office (CSO), which in Washington State is the first stop clients make to receive any form of public assistance. Each of the 39 counties has a CSO. Two important things happened there: first financial eligibility for public assistance was determined, and second, those deemed in need of an assessment for substance abuse

were referred to an ADATSA assessment center. From our sample, 2195 clients were determined to be financially eligible for assistance, and were referred for assessment.

At assessment, a client's clinical eligibility for treatment was determined. Assessments for this study occurred in the fall of 1989. Counselors assessed the client's history of substance use, current level of use and functioning. The assessment instrument that was used was unique to Washington State, but its attempts to measure common areas of concern for clinicians, such as addiction severity, legal, medical and psychiatric status, and living arrangements. Based on the assessment, addiction severity was divided into three categories, mild, moderate and severe, and only those that were severely dependent were clinically eligible for treatment under ADATSA. Thus, among clients in this study, there was little measurable variation on this key variable. The legislation that created the ADATSA program also specified that in addition to being severely addicted, clients must be incapacitated by their dependence, meaning that they were unemployable because of it. Of the 1746 assessed, 1537 were found to be clinically eligible for treatment.

After clinical eligibility was determined, a treatment plan was drafted. If the client accepted this plan, the counselor began the process of finding openings with treatment programs that contracted with the state. 1411 clients accepted their plan, and of that number, 1228 entered treatment. For this study, our analyses were limited to those clients that entered treatment in late 1989 or early 1990.

2.2. The intervention

Most publicly funded treatment in Washington State, including that provided under ADATSA, follows the 12-step model. Typical treatment plans included multiple modalities, like some form of inpatient treatment coupled with outpatient care. These plans were constructed according to the needs and the living situations of clients. The most common plan included 30 days of inpatient care followed by 90 days of outpatient, while a common variant of that included 30 days of inpatient

Table 1
The ADATSA process

Phase	Description
1 Community service office visit (<i>n</i> = 2195)	These are state offices where clients first seek public assistance; financial eligibility is determined here. then clients are referred to an assessment for chemical dependency problems
2 Assessment (<i>n</i> = 1746)	With a clinician, clients answer questions about their dependency, health status, and living arrangements
3 Eligibility determination (<i>n</i> = 1537)	To be clinically eligible for treatment, clients must be considered severely dependent on alcohol or drugs. and unemployable as a result of their addiction; also, clients must be amenable to treatment
4 Acceptance (<i>n</i> = 1411)	The clinician and the client agree on an appropriate treatment plan and schedule an entry date
5 Enter treatment (<i>n</i> = 1228)	The client voluntarily begins treatment

followed by 60 days of care in a recovery house then 90 days of outpatient care. Plans were designed to provide the amount of services necessary to overcome the addiction and allow the client to return to the labor force.

Treatment under ADATSA was conceived of in three phases: primary, reintegration, and aftercare. In primary care, addiction was the only topic addressed and clients were provided with the information and tools needed to recover. In the reintegration phase, clients were helped to transition from a structured treatment setting to independent living. In aftercare, clients were provided continued support to maintain sobriety in an unstructured setting. All three phases of treatment were incorporated in each treatment plan.

A key challenge for this study was determining the amount of treatment received. Unfortunately, there was no data available on treatment contacts, such as the number of inpatient days, or the number of outpatient sessions attended. Our alternative was to base this determination on how much of the original treatment plan was completed. Assessment center records contained discharge status information for each modality of treatment. An implication of this decision should be noted: while two clients might both have completed their entire treatment plan, they might in fact have received different amounts of treatment.

Information from discharge codes was then used to categorize people into three groups, those who completed their entire treatment plan, those who completed the primary phase only, and those who dropped out prior to completing their primary phase. Since treatment plans were tailored to suit individual needs, completing a 4 week phase of inpatient treatment for one client would have been considered to be equivalent to completing an 8 week phase for another.

For clients who completed their chemical dependency treatment, there was an option of attending a program of vocational services. There were three such programs situated across Washington State. Their goal was to provide extra vocational services to supplement the ADATSA program. These programs were typically 2–3 months in length, and provided aptitude and assessment identification, as well as intensive training in job-seeking skills. Here again we have no data on the specific number of contacts clients had with their provider, just a discharge code indicating whether a client completed their program.

In summary, the following five mutually exclusive groups were constructed for comparative purposes. Clients were grouped into those who:

1. entered but did not complete the primary phase of treatment;
2. completed primary treatment only;
3. completed all treatment, but did not enter vocational services;

4. completed all treatment, entered but did not complete vocational services;
5. completed all treatment and vocational services.

2.3. Sampling

The numbers of clients at each stage in the ADATSA process has been referred to previously. This section will focus on how those clients were selected. A statewide representative sample of ADATSA clients was selected for this study. Sampling was conducted in two stages. Since much of the data was housed at assessment centers, the first step was to select centers from across Washington, to insure sufficient geographic representation. Assessment centers were based in counties. Except for the two least populous counties, each of Washington State's 39 counties had an assessment center. The centers were grouped into four strata based on number of assessments they conducted. The top two strata contained few centers, but performed the majority of assessments. Therefore, each of those centers was included in the sample. A total of 44% of the assessment centers were then chosen at random from the remaining strata. In all 23 out of 37 centers were selected. Then, from the chosen centers, client records were picked at random. Any client referred for an assessment was eligible for selection. (For a more detailed discussion of sampling methods see Longhi et al., 1991). After careful consideration, some clients were dropped from our analyses. A small percentage of people died over the course of the follow-up period. We also dropped clients on AFDC, which included many pregnant women, because of the limits their situation placed on employment prospects. Our preference would have been to analyze them separately, but their numbers were too small to draw meaningful conclusions.

2.4. Data

All data came from secondary sources, as there was no direct contact between researchers and clients. Information on the type and extent of treatment received, discharge status, and client characteristics came from intake forms used at assessment centers across the state of Washington. Data on earnings came from the wage and hour file collected by Washington State's Department of Employment Security. This file records wages and hours of work performed in Washington State, as reported by employers. It is the most complete source of data on employment and earnings. Aside from its objectivity, the wage and hour file also made a long follow-up period possible, because direct contact with clients was not necessary. The wage data spanned from 1987 until 1995.

2.5. Data structure and analysis

Our data was structured in two different ways, depending on the particular analysis. The first objective was to compare differences across groups after treatment. To do so, cross-sections, observations on clients at a single point in time, and time series, regular temporal observations, were combined into one data set. This data structure increased greatly the number of cases: our unit of analysis was no longer the individual client, but the individual client in a particular 6 month period. So, instead of one observation per client, we had nine. The increased number of cases improves the statistical efficiency of our estimates. Regression analysis was used to estimate group differences in earnings over time.

In the regression analysis, covariates were included to control for any pre-existing differences between the groups. We controlled for basic demographic factors, such as age, race, and gender. Labor market outcomes are typically explained in terms of the human capital of participants (Becker, 1993). For this reason, pre-treatment wages were included, because they were as close as we could come to measuring job skills and motivation to work. Another important element of human capital is education, and we distinguished clients who had education beyond high school from those who did not. Our sample included clients from across the state of Washington, and characteristics of labor markets across the state varied. Exploratory analyses showed that clients living in areas where agriculture was a primary industry earned more than clients elsewhere. These analyses also showed that a common pattern for these clients was to enter and leave the labor market frequently. Given these two pieces of information, we hypothesized that clients residing in counties where the amount of seasonal labor was high might have an advantage. To control for this effect, we included the percent of seasonal labor in each county in our statistical model. Values for that variable came from the Labor Market and Economic Analysis Branch of the Washington State Department of Employment Security.

For our second comparison, average wages within groups were examined across time. No special data structure was needed for this analysis. Average monthly earnings, calculated from the 24 months before and after treatment, were compared and differences were analyzed using *t*-tests. The advantage of this analysis was that it eliminated the problems created by self-selection that occurs when we compare across groups. Because in many cases individual wages varied greatly from month to month, we aggregated wages into 6-month periods, then divided that total by six to obtain an average monthly wage for the period. All earnings amounts were adjusted to represent constant 1992 dollars.

When justified by the literature or our exploratory analyses, we included terms in the models that represented the interaction between treatment and the covariates. For example, we explored an interaction between completing treatment, or vocational services, and wages prior to treatment. Also, because this study had a lengthy follow-up period, we were interested in whether earnings differed over time. To test this, we included categorical variables in our equation that represented each individual 6-month period.

While all clients elected to enter treatment, some chose to complete it, while others did not. If clients who completed treatment were different than those who did not, then those differences might have influenced our results. Heckman (1979) proposed a two-equation model to deal with the problem of self-selection. The first step in this process involves attempting to predict, using logistic regression, who will complete chemical dependency treatment and who will not. From that equation, a correction factor is calculated which is then included in a subsequent equation to predict earnings. We tried the two equation model, dividing clients into two categories, those who completed at least their primary phase of treatment, and those who dropped out prior to that point. The variables we had did not predict accurately who completed treatment and who did not. When a correction factor is calculated from a poorly fitting model, and used as an independent variable in the subsequent regression equation, the parameters of the second equation become highly unstable and nearly impossible to interpret. Thus, our attempt to statistically control for selection did not yield meaningful results. With data such as ours, where the groups are similar in terms of the measured characteristics, a statistical correction for self-selection is not possible.

3. Results

Table 2 presents key client characteristics. Males significantly outnumber women in all treatment groups, and whites outnumber minorities. There were significant differences between groups on pre-treatment earnings only. The group receiving vocational services earned, on average, \$243 per month in the 2 years prior to treatment, compared to \$188 per month for the treatment group and \$175 per month for those clients who started, but did not complete treatment. These differences are important, for they might reflect differences in job skills, or motivation for employment. However, having data on earnings for such a long period prior to treatment allowed us to statistically control for these existing differences.

Table 3 presents the results of our regression analysis. Our first interest was in comparing the earnings of groups of clients who received different levels of treat-

Table 2
Key client characteristics

	Completed all treatment, and completed vocational services (<i>N</i> = 305)	Completed all treatment, entered but did not complete vocational services (<i>N</i> = 317)	Completed all treatment, did not enter vocational services (<i>N</i> = 135)	Completed primary treatment only (<i>N</i> = 131)	Did not Complete primary treatment (<i>N</i> = 132)
Age <30 (%)	34	30	29	41	38
Male (%)	69	73	67	69	76
White (%)	77	66	75	74	78
Married (%)	7	5	15	15	10
Education >12 years (%)	16	22	23	15	24
Average monthly earnings, 2 years prior to treatment	\$243	\$166	\$183	\$188	\$175

Table 3

Regression analyses predicting average monthly earnings in the 4½ year follow-up period ($N = 8775$, standard error in parentheses)

Independent variables	Regression coefficients
Age <30	62.31 (11.41)***
Average monthly wages, 2 years prior	0.576 (0.017)***
Married	6.09 (18.53)
White	8.44 (11.97)
Male	45.26 (11.70)***
Education >12 years	109.24 (13.33)
Groups	
Completed all treatment and vocational services	268.04 (18.33)***
Completed all treatment but did not complete vocational services	122.06 (18.32)***
Completed all treatment only	38.00 (19.73)***
Completed primary treatment only	116.63 (21.67)***
Percent of seasonal labor	3.40 (0.916)**
R-squared	0.16
F-value	84.27***

*** $P < 0.001$

** $P < 0.01$.

ment. Controlling for differences in background characteristics and pre-treatment earnings, clients who com-

pleted treatment earned \$130 per month more on average than those who dropped out, while those receiving vocational services earned \$268 per month more than those who dropped out. Also, those completing vocational services earned significantly more than those who only completed treatment, and the size of that difference was quite large. On average, a client completing vocational services earned \$138 per month more than one completing treatment only.

In addition to the differences between groups, there were other interesting findings. White clients did not earn significantly more than minorities. On average, men earned more than women, and those less than 30 years old earned more than those who were older, though in either case, the difference was relatively small. In contrast, the effect of variables measuring human capital, prior wages and education, were much larger. Clients having some college earned \$109 more per month than those having none, while every additional dollar in pre-treatment wages results in \$0.57 in additional post-treatment earnings. Earnings did not vary to a significant extent through time. Categorical variables representing each of the 6-month periods after treatment were found insignificant, and were dropped from our regression model.

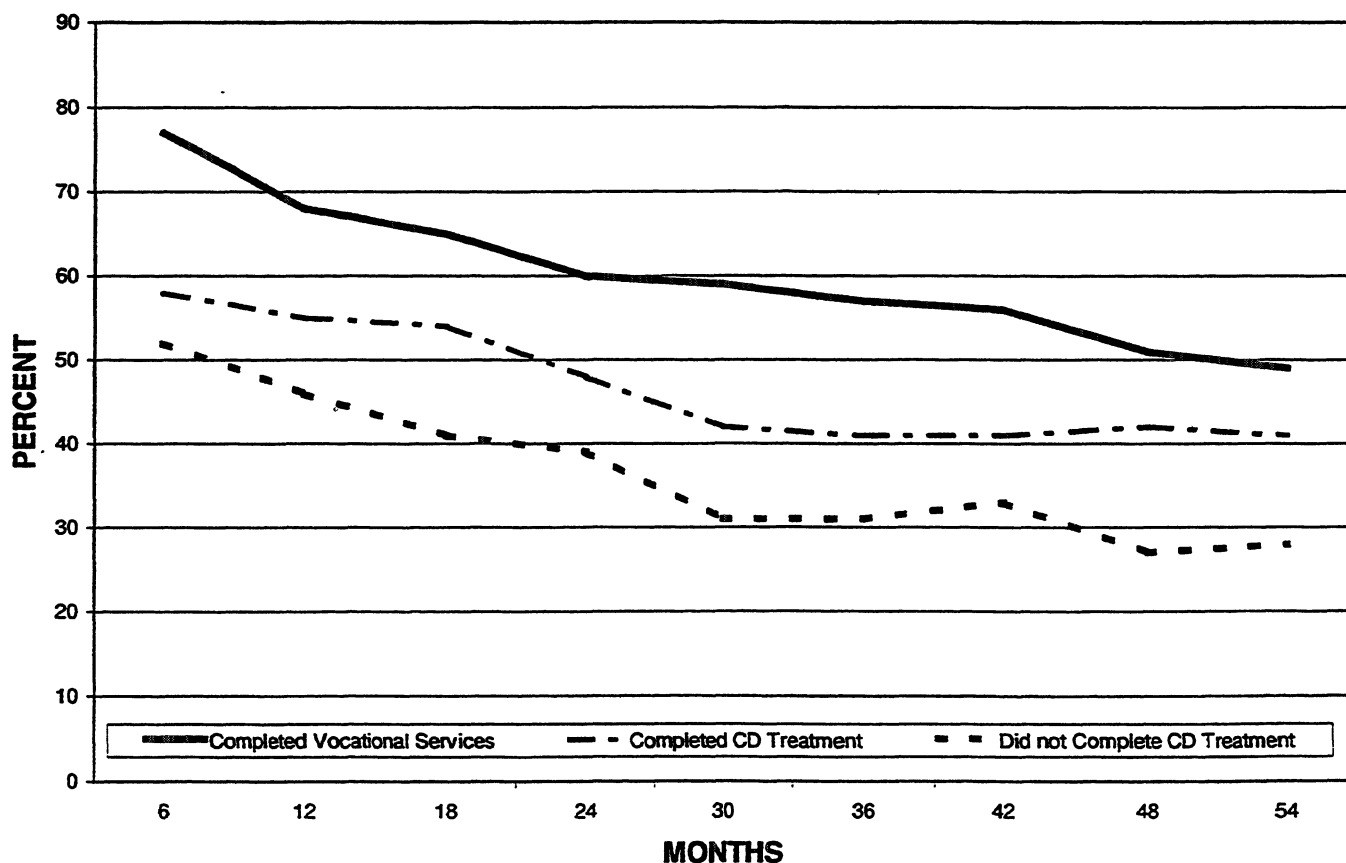


Fig. 1. Employed at 6 month intervals across the follow-up period.

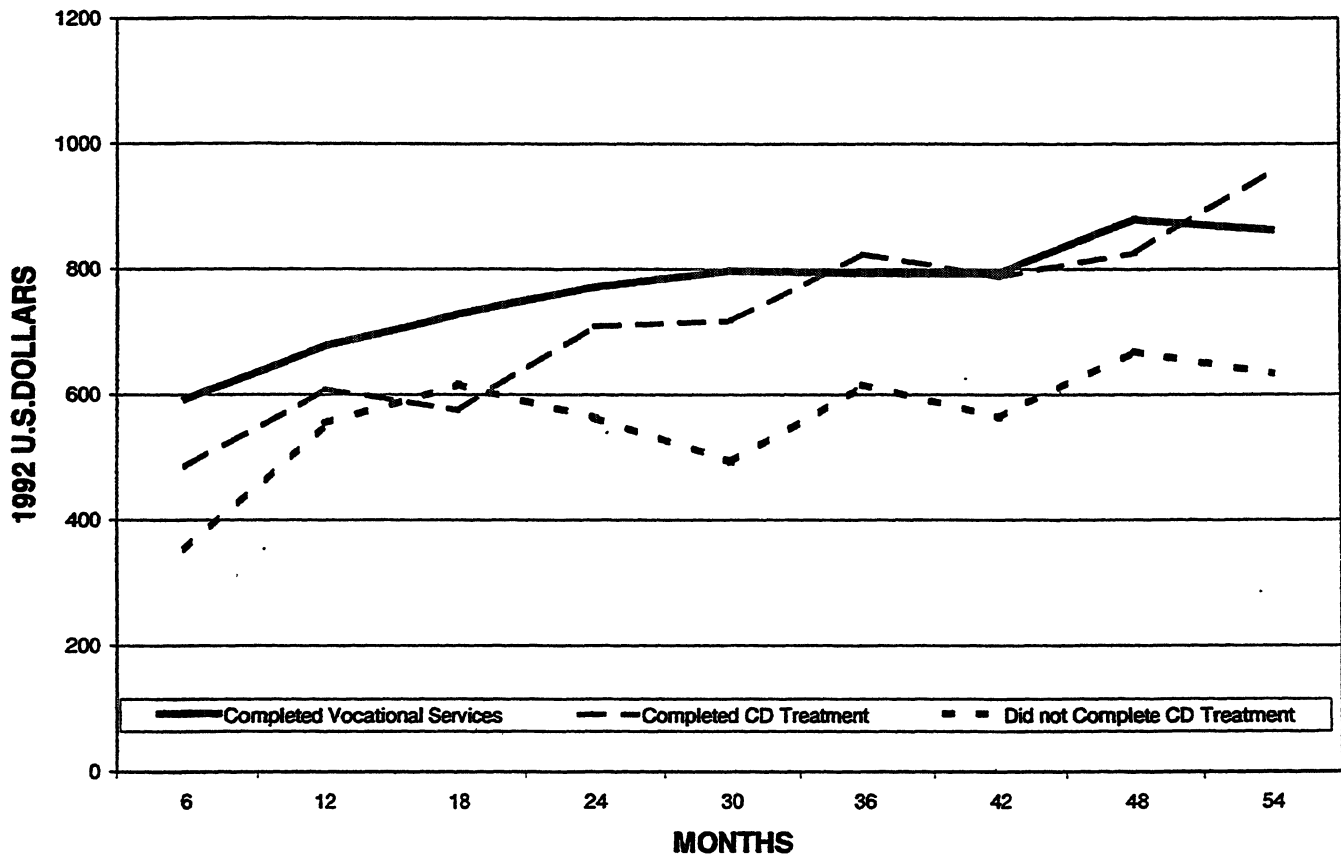


Fig. 2. Monthly earnings across the follow-up period for employed clients.

Figs. 1 and 2 explore the reasons for the consistency of earnings over time. Fig. 1 shows the percent of clients employed over the course of the follow-up period. To increase the clarity of this presentation, we show the results for only three of our five groups. The most obvious fact from this graph is that the percentage employed in each group fell over time (the same is true of the groups whose results are not shown). For example, 77% of clients completing vocational services were employed during the first time period, while 49% were employed at the end of the follow-up period.

Since average group earnings remained constant over the follow-up period, in spite of a decline in labor market participation, the wages of clients who were employed must have increased over time. Indeed, these increases are shown in Fig. 2. Employed clients who completed their vocational program earned on average nearly \$600 per month immediately after completion, while those employed $4\frac{1}{2}$ years later were earning nearly \$900 per month. The same is true of those completing treatment only. In fact, the wages of that group exceeded all others in the final period. Even those who failed to complete treatment had higher monthly wages as time progressed. However, as can be seen in Fig. 1, the percent of that group employed was quite small.

Table 4 addresses within-group differences over time.

That table presents the average wages before and after treatment, as well as the results of *t*-tests. Since our regression analysis showed that earnings did not vary significantly over time, the after-treatment amount reflects the average for the entire $4\frac{1}{2}$ -year follow-up period. The table shows that clients who completed vocational services and those who completed treatment earned significantly more after receiving services. Indeed, vocational services clients earned \$185 per month more, while those completing treatment only earned \$107 per month more. These results indicate a positive association between entering a vocational program, or treatment, and subsequent earnings. In contrast, those who failed to complete treatment earned significantly less afterward.

4. Discussion and conclusions

Studies of employment after chemical dependency treatment, particularly those employing secondary data, are rare. This work attempted to fill that gap. We have documented the employment outcomes, over a $4\frac{1}{2}$ year follow-up period, of a group with severe labor market disadvantages. After the intervention, clients who com-

pleted treatment, and those that completed a vocational program, earned significantly more than clients who did not. These results were obtained even after controlling for differences in average wages in the 2 years before treatment. Differences in average earnings were consistent over our follow-up period. Also, and perhaps more importantly, clients receiving treatment only, and those receiving vocational services, earn significantly more after receiving these services than they did before.

4.1. Limitations

This study was subject to several limitations. Our measures of treatment received were limited in two respects. First, treatment groups were based on the amount of the original treatment plan that was completed, as opposed to the number of client contacts, or some other measure of intensity. Unfortunately, our data did not allow us to create intensity measures. Second, we assessed the effects of one treatment episode only, while it is well known that treatment for drug and alcohol addiction often involves more than one episode. It is quite probable that treated clients would have received additional treatment in the follow-up period, or that they received services from an additional source. If true, then those additional services might explain the group differences we observed. Unfortunately, we had no data on services received in the follow-up period. However, the probability of obtaining additional services was equally great for those receiving only small amounts of treatment. For this reason, it is impossible to tell what influence these missing data might have had on our results.

Relying on an archival data source allowed for a long follow-up, and for particularly good data on our outcome measure. However, we did not have data over time on client characteristics. The ideal study of this sort would combine objective outcome data with self-reported measures on important client characteristics taken at regular temporal intervals. However, because

of attrition, such a study would be very difficult to conduct.

Finally, because of our quasi-experimental design, these findings should not be taken as conclusive. Random assignment was not possible. The ADATSA program's intent is to offer treatment to all that are deemed clinically eligible, as opposed to creating conditions for conducting rigorous, controlled experiments. True random assignment has the advantage of precluding any selection effect, but as Holder et al. (1992) point out, even the diagnosis of a substance abuse problem introduces selection, because in most cases clients must present themselves for diagnosis. It is possible to randomize clients *after* they elect to pursue treatment, but randomization before that time, when it would be most appropriate from a scientific point of view, is nearly impossible. Also, even if random assignment was more feasible, some clients who want treatment might have chosen to avoid a random assignment situation, again introducing a selection effect.

In spite of the problems that self-selection presented, there are reasons to have some confidence in these findings. The process of receiving treatment under ADATSA involves several levels of selection, and our analyses included only those who chose to seek and enter treatment. Thus, our analyses only compared people with at least some degree of motivation to deal with their addiction. In contrast, it would have been possible to compare clients receiving treatment with those receiving only an assessment. That strategy would have increased the problems associated with self-selection, whereas our decision was designed to minimize such problems. Groups in this study were similar in many respects, particularly in the severity of their addiction. Indeed, when attempting to statistically control for selectivity, we could not predict with accuracy, who completed treatment and who did not. The data we had did not adequately distinguish the groups. There were differences in pre-treatment wages, which were strongly correlated with our outcome. But, having that data

Table 4
Comparing pre and post treatment wages (standard deviations in parenthesis)

	Average monthly pre-treatment wages (in the 2 years before treatment)	Average monthly post-treatment wages (in the 2 years after treatment)	<i>t</i> -test
Completed all treatment and vocational services	\$243 (320)	\$428 (510)	114.90***
Completed all treatment but not vocational services	\$166 (306)	\$239 (408)	51.62**
Completed all treatment only	\$183 (258)	\$290 (419)	48.63***
Completed primary treatment only	\$188 (278)	\$273 (369)	13.39*
Did not complete primary treatment	\$175 (350)	\$158 (330)	−8.57*

*** $P < 0.001$.

** $P < 0.01$.

* $P < 0.05$.

allowed us to control for those differences in our regression analysis.

4.2. Policy implications

The fact that group differences in average earnings were consistent across time was surprising. That consistency can be explained by the fact that while the proportion of clients employed fell, regardless of the group they were in, the earnings of those employed rose. Obviously, such results present a mixed picture. The increase in wages of employed clients is a positive finding. Some clients improved their job skills and became more valuable employees. On the other hand, overall labor market participation fell. That decline could be as a result of a number of factors, such as relapse, or a need for additional treatment. Conversely, economic conditions might have played a part. Recall that our follow-up period ran from 1990–1995, and during the middle years of that period a recession was in progress. Despite the possibility of an economic explanation for these findings, further research must be devoted to the issue of employment retention, so that clinicians and those that administer treatment and vocational programs have a better understanding of why clients obtain employment and why they remain employed. Our results showed that for those completing vocational services, the largest decline in labor market participation came in the first 6 months of the follow-up period. Waldo and Gardiner (1984) consider this to be a 'vocational crisis period', and argue that support needs to continue at least 3 months after obtaining employment. This decline in labor market participation, while unfortunate, should be placed in context: when these clients were assessed, all were deemed unemployable.

When evaluating public programs, interests vary across different audiences. While clinicians might emphasize subsequent alcohol or drug use, state policy-makers might emphasize employment outcomes. These results have important public policy implications. There is, and will continue to be, pressure to limit publicly-funded financial assistance to all clients, whether addicted or not. Thus, labor market outcomes will become increasingly important for the personal welfare of addicted individuals. These results show that clients receiving chemical dependency treatment, and additional vocational services, earned more than similar

clients who did not. In this regard, this research corroborates the findings of McLellan et al. (1993) on the value of providing supplemental services in addition to treatment. However, average earnings were low, and sustaining oneself on such earnings would be difficult. Clearly, vocational services for ADATSA clients, or other similar people, are imperative if they are to live above poverty levels. In addition, vocational programs should be funded so they can not only assist clients in finding employment, but also in retaining it.

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